



Illinois Mathematics and Science Academy
1500 Sullivan Road
Aurora, IL 60506-1000

Application For SIR Placement at Fermi National Accelerator Laboratory (FNAL)

(provide two recommendations – see rec form; please use a computer to complete this application legibly)

Name: Messina John Date: 1/4/15
Last First Middle month / day / year

Home Address: 604 Silver Spring dr
Number and Street

Springfield Illinois 62702 Home Telephone: 217 – 891 - 3856
City State Zip Code (include area code)

Person to be notified in an emergency: Robert Messina

Telephone (office hours): 217 – 836 - 0879 Telephone (other hours): 217 – 836 - 0879
(include area code) (include area code)

Student Cell Phone: 217 – 891 - 3856 Year of Graduation:
2017

Suggested FNAL Advisor: None

Gender: ☒ male ☐ female Age: 15 Country of Citizenship*: United States

*Citizens other than from the United States must complete the following information:

Permanent Resident: ☐ Yes ☐ No

Place of Birth: _____
(City, State, Country)

Passport No.: _____ Expiration Date: _____

All non-U.S. citizens must present their original, unexpired foreign passport on the first day of the program. Photocopies are not acceptable. Depending on your circumstances, you also must present:

- Form I-94 Arrival Departure Card that shows lawful admission to the U.S. and the end date of your “authorized stay”, **PLUS**:
 - Form I-797 Notice of Action approving H-4, O-3, TD, E-3 or other nonimmigrant (temporary) visa status in the U.S. , OR
 - Form DS-2019 Certificate of Eligibility for J-2 status, OR
 - Form I-20 showing F-2 status, **OR**
- Greencard (Alien Registration Card, or I-551 Card) showing grant of lawful permanent resident status.

Describe your skills, abilities, proficiencies; please be honest.

Highest Math Level/Skill: All math courses up to but not including Calculus.

Skill with Statistics: Some statistical skill including use of Excel to find statistics such as standard deviation, standard error, confidence interval, range, median, mode and mean.

Science Classes: Biology, Physics, Chemistry

Describe Your Laboratory Skills: Laboratory skills include use of Logger Pro, motion sensors, vortexes, microscopes, pipettes, graduated cylinders, test tubes, force plates, scales, multi – meters, spectrometers, and Bunsen burners.

Prior Research (SIR) Experience (include advisor name/location): None

Computer Proficiency: Please indicate your skill level for each of the below.

	none	introductory	intermediate	advanced
Basic	X			
C/C++	X			
Fortran	X			
Java			X	
Other Languages(list)	X			
Mathematica	X			
Matlab	X			
Other Programs (list)	X			
Unix(Linux)	X			
Windows			X	
Mac		X		
Other OS (list)				

Rank Your Interests (Do not rank any area that you would not be willing to pursue an investigation in.)

2 Astronomy/Astrophysics Hands-on Building 1 Particle Detection
5 Beam Manipulation Engineering Programming
 Beam Safety 3 Mathematical Modeling
4 Computer Simulations Medical Applications

Attach an application that includes the following items:

- Academic honors and awards that you have received. Please limit to ten or less honors/awards that you feel are the most significant.
- Extracurricular activities, interests, and any leadership role(s). Please limit to ten or less activities/interests that you feel are the most significant.
- Explain why research at FNAL would be a benefit to you and what you expect from participation in an investigation at FNAL. (Limit your answer to 250 words or less.)
- What would you tell a FNAL scientist about yourself so that you would be selected to work with her or him? (Limit your answer to 250 words or less.)
- Explain one exceptional experience you had with STEM in the last year. (Limit your answer to 250 words or less.)

Placement at FNAL also requires:

- Fermilab Visitor ID Form (form attached)
- Proof of Medical Coverage (form attached)
- Work Permit (required of students who are under 16 years of age)
- Documentation of Immigration Status (see first page)

- Authorization for Issuance of an ID Card (form attached)
- Student Registration (form attached)

- Note that some information is repeated on the attached forms, which will be filed with the appropriate offices at FNAL once a student has a specific placement.

*I understand that by submitting this application for placement at the **Fermi National Accelerator Laboratory** I may not apply for or seek other SIR opportunities until a decision has been made about this application. Placement for SIR at FNAL is not guaranteed by submission of this application.*

Robert Messina 5/3/2015
Signature of Parent/Guardian Date

John A Messina 5/3/2015
Signature of Applicant Date



John Messina

- Academic honors and awards that you have received. Please limit to ten or less honors/awards that you feel are the most significant.

Science, Inquiry and Discovery Award – awarded to school's most scientifically motivated student

- Extracurricular activities, interests, and any leadership role(s). Please limit to ten or less activities/interests that you feel are the most significant.

Mu Alpha Theta
Chemistry Club
Chess Club
Swim Team
Ping pong Club
Math Team

- Explain why research at FNAL would be a benefit to you and what you expect from participation in an investigation at FNAL. (Limit your answer to 250 words or less.)

Fermi National Accelerator Laboratory represents an incredible opportunity to me. At Fermilab, I could gain valuable laboratory experience to learn modern science and improve my laboratory skills. At FNAL, I would participate in a lab setting and learn about the many scientific resources available at Fermilab such as the accelerator complex. I have researched the use of the accelerator complex in the Long Baseline Neutrino Experiment, and I would love an opportunity to understand the way in which the accelerator launches neutrino beams. At FNAL, I could observe the accelerator in action, which would drastically improve my understanding of the technology used in modern science. At the Illinois Math and Science Academy, I have been able to conduct my own research and participate in many classroom labs. However, Fermilab represents a much more real laboratory and opportunity for me to make the next step toward a career in science.

As an assistant at FNAL, I would contribute to real life research gain an understanding of interactions between scientists during an experiment and the role of technology in the experimental process. At IMSA, technology plays an integral role in our exploratory learning. However, the experiments we conduct are not new. An SIR at FNAL would be an incredible opportunity to see how new research is conducted using technology in the modern laboratory. I hope that after Fermilab, I will be well prepared for future research and have an accurate understanding of work in a national laboratory such as FNAL.

- What would you tell a FNAL scientist about yourself so that you would be selected to work with her or him? (Limit your answer to 250 words or less.)

Curiosity defines me. I love to research and improve my understanding of the universe. At IMSA, I've been able to experience unique opportunities such as the class Methods in Scientific Inquiry, during which I was able to conduct my own study. However, my study at IMSA was limited to the tools and technology which IMSA could provide. At FNAL, I would have the opportunity to exercise my curiosity through a modern study, and to experience science as it is conducted professionally. My drive to constantly improve myself makes me well suited to work in a research setting, as I am passionate about science and the joy of finding an answer. I frequently devote free time to the study of advanced topics I haven't yet studied in school, and industriously work to accelerate my learning. For example, I will be advancing in IMSA's mathematics curriculum an additional level next year because I will continue my studies over the summer through the use of a class at a

local college. I believe that my personality traits and interests in science would assist me in a study at Fermilab. In addition, my mathematical talent and laboratory skills are incredible assets, both of which would be useful to me in assisting an FNAL scientist in his or her research. I believe that my talent, curiosity and drive make me an apt assistant to have working at FNAL.

- Explain one exceptional experience you had with STEM in the last year. (Limit your answer to 250 words or less.)

Last semester at IMSA, I took a class called Methods in Scientific Inquiry. It requires students to propose their own experiments and to conduct them using the resources of the Academy. During the class, my partner and I studied the effect of exposure to different types of light on the efficiency and power generation of a polycrystalline solar panel. The process began with a proposal and a list of required materials. Then, the instructor provided the materials and allowed us to work. After conducting the experiment several times, we analyzed our data and submitted a paper comprised of an abstract, introduction, methods section, results section, and discussion section. This experience inspired me and was a phenomenal opportunity for me to conduct my own scientific experiment.

Methods in Scientific Inquiry was also an important experience for me because it required me to explain my choices. I had to explain why I chose to analyze the wavelength of the light and why I chose an ANOVA test to compare the efficiency of the panel with the light's wavelength. I also had to explain its importance. Before Methods in Scientific Inquiry, I had not considered that I would need to explain *why* I chose a certain structure for my experiment. I learned that the reasons necessitating an experiment are equal in importance to its results. My participation in Methods in Scientific Inquiry was an incredible experience for me in science because it revolutionized my thinking about the scientific process.

Student Name: MESSINA, John Alexander
Date of Birth: 07/30/1999
Entry Date: 08/14/2014

Illinois Mathematics and Science Academy
School Code:140177

Y14-15

Grade 10	Literary Explorations I
Grade 10	Literary Explorations II
Grade 10	American Studies
Grade 10	Mathematical Investigations III
Grade 10	Mathematical Investigations IV
Grade 10	Scientific Inquiries - Chemistry
Grade 10	Scientific Inquiries - Physics
Grade 10	Scientific Inquiries - Biology
Grade 10	Methods in Scientific Inquiry
Grade 10	Moving and Learning
Grade 10	Russian I

<u>Sem1</u>	<u>Sem2</u>	<u>Credit</u>
A-		0.50
	B+	0.50
A-	B+	1.00
A-		0.50
	A-	0.50
B		0.50
	A-	0.50
	B	0.50
B		0.50
B	B	0.50
A	A-	1.00

Niane M Stegmayer

Academic Program

All IMSA courses are college preparatory.

Explanation of Grades

A	Exceeds course requirements
B	Meets course requirements
C	Needs improvement
D	Does not meet course requirements; no Academy credit awarded
I	Incomplete, course requirements not completed when grades were issued
WF	Withdrawn from course with failing grade; no Academy credit awarded
W	Withdrawn from course; no Academy credit awarded

Pass/Fail Options

P+	Exceeds course requirements (Pass with Distinction, used only in Independent Study and Student Inquiry and Research courses)
P	Meets course requirements; Academy credit may/may not be awarded depending on course grading criteria
F	Does not meet course requirements for course taken pass/fail; no Academy credit awarded

Intersession (one week non-credit course)

S	Satisfactory completion of requirements
U	Unsatisfactory completion of requirements

GPA/Class Ranking Policy

In light of IMSA's selective admission process and in order to promote collaborative exploration and discovery, the Academy does not compute grade point averages and class rankings.

Standardized Test Scores

Standardized test scores are provided by the student.

Student Inquiry and Research

(Inquiry and Mentorship) includes on-campus and off-campus experiences in which students plan, investigate, analyze, and communicate in-depth scholarly investigation, either guided or directed, by scientists, scholars, and/or educators.

TALENT (Total Applied Learning for Entrepreneurs)

Is a program that promotes entrepreneurial applied science and technology.

Federal and State Constitution Requirements

Are fulfilled with successful completion of American Studies.

Physical Education Requirement

Is fulfilled with successful completion (pass) of physical education or wellness.

Notice to persons or agencies receiving student records:

Section 438(b)(4)(B) of U.S. Public Law 93-380 requires that this pupil record information be transferred to you only on condition that you will not permit any other party to have access to it without the written consent of a parent/guardian or eligible student.



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Illinois Mathematics and Science Academy
The World's Leading Teaching and Learning Laboratory for Imagination and Inquiry
Student Inquiry and Research
Recommendation Form

Student Name John Messina **graduation year** 2017

Recommender Sowmya Anjur sanjur@imsa.edu
(name) (email)

Recommender: The student listed above wishes to participate in the Student Inquiry and Research (SIR) Program. SIR advisors are frequently requesting additional information so your assistance is needed in recommending and evaluating students. This completed form, as a pdf file, may be sent to off-campus individuals to assist with best placement of students.

1. Please rate the student on each of the following criteria, with 5 being highest and 1 being lowest, based on your experiences with IMSA students.

Criteria	5	4	3	2	1	No basis for judgment
Motivation for the investigation	x					
Intellectual potential	X					
Ability to analyze/problem solve	X					
Teamwork skills	X					
Perseverance	X					
Maturity	X					
Works independently	X					
Communication skills	X					
Integrity	X					
Overall judgment	x					

Please comment on the preparedness of the student to participate in an independent investigation.

This student is well prepared to participate in an independent investigation. He did an MSI project that required a lot of initiative and drive and when the project required trouble shooting, he did a great job bringing the project to fruition.

Is there anything else that you feel a potential advisor should know about this student?

This student is driven and will do a great job.